



**Entergy Nuclear Northeast
Entergy Nuclear Operations, Inc.**

James A. Fitzpatrick NPP
P.O. Box 110
Lycoming, NY 13093
Tel 315-349-6024 Fax 315-349-6480

JAFP-13-0001
January 3, 2013

Michael J. Colomb
Site Vice President - JAF

United States Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555-0001

SUBJECT: LER: 2012-007, Reactor Scram Caused by Main Turbine Emergency Trip
Lockout Valve Failure
James A. FitzPatrick Nuclear Power Plant
Docket No. 50-333
License No. DPR-59

Dear Sir or Madam:

This report is submitted in accordance with 10 CFR 50.73(a)(2)(iv)(A), System Actuation.

There are no commitments contained in this report.

Questions concerning this report may be addressed to Mr. Chris M. Adner, Licensing Manager,
at (315) 349-6766.

Sincerely,

A handwritten signature in black ink, appearing to read "M. Colomb", written over a horizontal line.

Michael J. Colomb
Site Vice President

MC/CA/jo

Enclosure(s): JAF LER 2012-007, Reactor Scram Caused by Main Turbine
Emergency Trip Lockout Valve Failure

cc: USNRC, Region 1
USNRC, Project Directorate
USNRC, Resident Inspector
INPO Records Center (ICES)

LICENSEE EVENT REPORT (LER)

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects.resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. FACILITY NAME

James A. FitzPatrick Nuclear Power Plant

2. DOCKET NUMBER

05000333

3. PAGE

1 OF 3

4. TITLE

Reactor Scram Caused by Main Turbine Emergency Trip Lockout Valve Failure

5. EVENT DATE

MONTH	DAY	YEAR
11	04	12

6. LER NUMBER

YEAR	SEQUENTIAL NUMBER	REV NO
2012	007	00

7. REPORT DATE

MONTH	DAY	YEAR
01	03	13

8. OTHER FACILITIES INVOLVED

FACILITY NAME	DOCKET NUMBER
N/A	05000
FACILITY NAME	DOCKET NUMBER
N/A	05000

9. OPERATING MODE

01

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)

- ☐ 20.2201(b)
☐ 20.2201(d)
☐ 20.2203(a)(1)
☐ 20.2203(a)(2)(i)
☐ 20.2203(a)(2)(ii)
☐ 20.2203(a)(2)(iii)
☐ 20.2203(a)(2)(iv)
☐ 20.2203(a)(2)(v)
☐ 20.2203(a)(2)(vi)

- ☐ 20.2203(a)(3)(i)
☐ 20.2203(a)(3)(ii)
☐ 20.2203(a)(4)
☐ 50.36(c)(1)(i)(A)
☐ 50.36(c)(1)(ii)(A)
☐ 50.36(c)(2)
☐ 50.46(a)(3)(ii)
☐ 50.73(a)(2)(i)(A)
☐ 50.73(a)(2)(i)(B)

- ☐ 50.73(a)(2)(i)(C)
☐ 50.73(a)(2)(ii)(A)
☐ 50.73(a)(2)(ii)(B)
☐ 50.73(a)(2)(iii)
☒ 50.73(a)(2)(iv)(A)
☐ 50.73(a)(2)(v)(A)
☐ 50.73(a)(2)(v)(B)
☐ 50.73(a)(2)(v)(C)
☐ 50.73(a)(2)(v)(D)

- ☐ 50.73(a)(2)(vii)
☐ 50.73(a)(2)(viii)(A)
☐ 50.73(a)(2)(viii)(B)
☐ 50.73(a)(2)(ix)(A)
☐ 50.73(a)(2)(x)
☐ 73.71(a)(4)
☐ 73.71(a)(5)
☐ OTHER

Specify in Abstract below or in NRC Form 366A

10. POWER LEVEL

100

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME

Mr. Chris M. Adner, Licensing Manager

TELEPHONE NUMBER (Include Area Code)

(315) 349-6766

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
X	TA	PSV	A014	Y					

14. SUPPLEMENTAL REPORT EXPECTED

☐ Yes (If yes, complete 15. EXPECTED SUBMISSION DATE) ☒ NO

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On November 4, 2012, at 9:53 pm, with the plant operating at 100% power in Mode 1, the James A. FitzPatrick Nuclear Power Plant experienced a reactor scram. The scram was due to a failure of the main turbine emergency lockout valve (94SOV-LV) which caused the main turbine stop valves to begin to close. Once the main turbine stop valves reached 85% open, a reactor scram signal was generated. This event is reportable in accordance with 10 CFR 50.73(a)(2)(iv)(A), any event or condition that resulted in manual or automatic actuation of the reactor protection system. Corrective actions included replacing the failed valve, testing the lockout circuit electrically, and shipping the failed valve offsite to have an equipment failure evaluation performed. There was no industrial or radiological safety significance associated with this event. The nuclear safety significance was minimal because all safety systems responded as designed when the scram signal was received.

LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
James A. FitzPatrick Nuclear Power Plant	05000333	YEAR	SEQUENTIAL NUMBER	REV NO.	2 OF 3
		2012	– 007	– 00	

NARRATIVE

BACKGROUND

At approximately 9:41 pm on November 4, 2012, Operations personnel were performing ST-21F, "Main Turbine Overspeed Trip Device and Mechanical Trip Valve Test." The purpose of ST-21F is to test the main turbine overspeed trip device and mechanical trip valve without causing a main turbine trip or affecting turbine speed. During performance of the surveillance, operators noted that annunciator 09-5-2-40 (Main Turbine Overspeed Lockout) remained lit following completion of step 8.2.5 where it should have cleared. Approximately 1 minute after step 8.2.5 had been performed, a full reactor scram occurred.

EVENT DESCRIPTION & ANALYSIS

On November 4, 2012, at 9:53 pm, with the plant operating at 100% power in Mode 1, the James A. FitzPatrick Nuclear Power Plant (JAF) experienced a reactor scram. Immediately after the scram, the main turbine tripped [EIS System Identifier: TA]. The sequence of events (SOE) log determined the reactor scram was caused by the Main Turbine Stop Valves [EIS Component Identifier: SHV] moving greater than or equal to 15% closed from full open. The root cause evaluation (RCE) and troubleshooting later determined that the scram was due to a failure of the main turbine emergency lockout valve (94SOV-LV) [EIS Component Identifier: PSV].

94SOV-LV is a solenoid operated, 4-way valve used in a 3-way configuration. During Main Turbine Overspeed Testing, the internal spool pieces are aligned in such a way so as to lockout pressure from the Mechanical Trip Valve and therefore prevent a loss of pressure to the Master Trip Solenoid Valve. Following the scram, it was noted that 94SOV-LV was degraded by evidence of overheating. During subsequent troubleshooting, the plastic casing started to melt and char due to excessive heat. The valve was removed and shipped offsite to determine the internal failure mechanism.

At the start of this event, there were no systems, structures, or components inoperable that contributed to this event. All control rods fully inserted, all primary containment isolations occurred as designed, the High Pressure Coolant Injection (HPCI) [EIS System Identifier: BJ] and Reactor Core Isolation Systems (RCIC) [EIS System Identifier: BN] initiated as expected. The RCIC system injected into the Reactor Coolant System (RCS) and HPCI did not; also as expected.

94SOV-LV had been recently replaced in September 2012. Following replacement, surveillance test ST-21F was successfully performed as preventative maintenance during JAF's refueling outage 20.

CAUSE OF EVENT

The most probable cause is that the emergency trip lockout valve stuck in an abnormal position which caused the solenoid to fail. After the solenoid failed, it is postulated that the spool(s) inside the lockout valve moved to a position that allowed hydraulic fluid to port off thereby causing a pressure loss to the master trip solenoid. This loss of pressure then allowed all four main turbine stop valves to begin to close. Once the main turbine stop valves reached 85% open, a reactor scram occurred. No contributing causes to this event were identified.

EXTENT OF CONDITION

A review of the Electro-Hydraulic (EHC) control system [EIS System Identifier: TG] was completed to determine if this failure mechanism could occur elsewhere in the system, resulting in multiple turbine valves repositioning, and causing a reactor scram. There is a similar shuttle valve called the Relay Trip Valve that is in series with the Emergency Trip Lockout Valve. The Relay Trip Valve uses EHC pressure from the pumping skid and relays it into Relay Emergency Trip System (RETS) pressure. This pressure maintains the disc dump valve on each of the four turbine control valves and four intercept valves closed thus allowing the valves to remain open and be controlled by the EHC system.

LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
James A. FitzPatrick Nuclear Power Plant	05000333	YEAR	SEQUENTIAL NUMBER	REV NO.	3 OF 3
		2012	– 007	– 00	

The relay trip valve is a mechanical device only, the shuttle (spool) is actuated via EHC oil pressure. It has no electrical interface and is not cycled at any time after the turbine has been reset. Therefore, the extent of condition for a reactor scram caused by a similar failure of the relay trip valve was deemed not applicable. In addition, the specific model used for the Emergency Trip Lockout Valve, 94SOV-LV is not used in any other location in the plant.

FAILED COMPONENT IDENTIFICATION

Description: Main Turbine EHC Emergency Trip Lockout Valve

Manufacturer: Denison Hydraulics (A014)

Model/Part Number: D1VW030HVG591XB962

FitzPatrick Component ID: 94SOV-LV

CORRECTIVE ACTIONS**Completed Actions**

- 94SOV-LV was replaced with the same model valve.
- The lockout circuit was statically and dynamically tested to ensure there were no other issues with the circuit.
- ST-21F was performed satisfactory with the Main Turbine offline, with the Main Turbine at 1800 RPM but not synched to the grid, and with the Generator synched to the grid.

Future Actions

- Perform an equipment failure analysis on 94SOV-LV to determine failure mode.
- Review Entergy and original equipment manufacturer recommended PM scope and frequency; revise the PM if necessary based on this review.

ASSESSMENT OF SAFETY CONSEQUENCES**Radiological & Industrial Safety**

There were no Radiological or Industrial Safety concerns associated with this event.

Nuclear Safety

There were no nuclear safety concerns associated with this event. The main turbine generator system is a non-safety related system. However, there are eight safety related position switches in the main turbine steam stop valves that will actuate to provide a reactor scram signal to the reactor protection system. As discussed in this LER, this system operated as designed.

SIMILAR EVENTS

The Entergy corrective action database was searched for events in which a reactor scram occurred due the closure of all main turbine stop valves. There were no previous events at JAF that had a match to this event, although two events were found to be similar in the Entergy fleet.

REFERENCES

- JAF Condition Report: CR-JAF-2012-07901, Root Cause Evaluation